PHYSICAL EDUCATION:

The only Solid Foundation of Moral and Intellectual Culture and Development:

AN

ADDRESS

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OF

PENNSYLVANIA COLLEGE, GETTYSBURG, PA.

At the Annual Commencement, Sept. 19th, 1851.

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ADDRESS.

Gentlemen of the Linnæan Association:

Upon accepting the invitation to address you on the present occasion, the question naturally presented itself, how I could best fulfil the important duties of such an appointment. Accustomed all my life to the practical and onerous duties of a laborious profession, and engaged at present, unceasingly, in the most active period of a medical life, I find myself having little relish for pursuits of a different character, and less time to appropriate to their consideration. Having no ambition beyond that of excellence in my chosen profession, I have aimed at nothing beyond, while the effort of many years devoted to that single aim, has so warped my mind, that I find it difficult to turn off the current of thought into a channel entirely new.

Hence, in the selection of a subject, my principal motive having been to be useful and instructive, it was requisite not to depart from the path of my ordinary pursuit. I have, therefore, thrown together a few thoughts on physical education, as being the only solid foundation of moral and intellectual culture and development, believing that the very circumstance of my experience in the study and practice of my calling, will necessarily give an authoritative bearing to my exposition of the subject. It is a subject, however, too extensive and abstruse, to be well discussed within the narrow limits of the hour prescribed for a popular lecture, but if I can do no more than impress you with a sense of its value, I shall consider that hour most profitably employed. Sir Thomas Brown says, "While I study to find out how I am a little world, I find myself something more than the great one." Warburton remarks that, "of all literary exercitations, none are of so immediate concern to ourselves as those which let us into a knowledge of our own nature; for these alone improve the heart, and form the mind to wisdom." Pope says, "the proper study of mankind is man." And when we turn to the Book of books, we see it written on the

very first page, in the language of God himself, "Let us make man in our own image, after our likeness;" thus exhibiting the exalted nature of our enquiry, and the intimate and perpetual connection between our physical and spiritual being.

By physical education I mean that attention to the body which maintains it in a state of the most perfect health, and consequently that which best fits it for all its uses, physical, moral and intellectual. Physical education, then, should begin with the first breath of life, and end only with our earthly existence. We come into this world, almost, as it were, mere physical beings, composed of plastic materials, capable of being moulded into nearly any form, and capable of receiving almost any moral and intellectual impress. Utterly passive, the most helpless of all created existences, devoid of almost every attribute of mind, save instinct, and possessing instinct even in a low degree, we enter life claiming and requiring peculiar care and sympathy. Destitute as we are at this period, we yet possess faculties and powers, which, rightly directed, are capable of inconceivable results. We taste, we feel, we see, we hear, and every impression made by external things upon our delicate senses, assists in the development of our reason, and lays the foundation of our ideas; and thus the realities and facts "of the world we inhabit are gradually reflected from within us, and an ideal universe is created, amid the marvels of which the rational spirit expatiates forever." Hours, days, years roll on before mature development is attained in physical organization, and it is not until then that the mind acquires its greatest vigor. In proportion as we improve in the condition of our corporeal functions, we strengthen in intellectual powers, and the progressive growth of the body, and its maintenance in a state of high health, is essential to the perfect ripening of the mind—showing an intimate and necessary relation between both. In all stages of bodily development, which follow a regular progression to maturity, we observe that the physical is, comparatively, the index to the mental. Infancy, childhood, adolescence, manhood, are severally marked by obvious distinctions, while these defined stages of life maintain, in both, a direct and most remarkable correspondence. This fact illustrates most happily, in a general way, what I desire here to demonstrate more particularly—that the state of the mind is in immediate relation with the present condition of the body—that health of body is essential to the fullest manifestation of mental

power—that every change in the state of the body is a change in the experience of the intellectual faculties, and consequently, that we should, as to a positive religious obligation, attend to the proper condition of the body, in order to invigorate the mind, and elevate it to the highest degree of power of which it is capable in its finite existence. "The simple idea of a being placed by Almighty wisdom, within a body, in order to employ it for intelligence and enjoyment, would appear to require that the organization and functions of that body should be so exactly adjusted to the being using them, and so perfectly coordinate with the conditions of external nature, that no disorder might by possibility occur, and no pain be experienced, but rather that every perception should be pleasure, and every action happiness.

The highest condition of man on earth, therefore, is maintained only in a state of perfect health—health of body and of mind, or, as Horace long since expressed it, '*mens sana in corpore sano*'—the man spiritual being intimately associated, in all manifestations, with the man physical. Let me, therefore, ask your attention for a few moments, to the organization of the body, and to the necessary conditions of its health.

The human body is a complex machine, composed of numerous elements, imbued with a vital principle, and the habitation of an immortal spiritual existence. If we take this living machine, and subject its gross or animal portions to the crucible of the chemist, it will undergo rapid disintegration, and be reduced to gaseous matter and ashes, the organic compounds being volatilized by heat, the inorganic or mineral matters coustituting the residuum. If we carefully collect and test these results, they will be found to consist of carbon, hydrogen, oxygen, nitrogen, phosphorus, sulphur, fluorine, chlorine, silicon, sodium, calcium, potassium, magnesium, iron, and occasionally manganese. These, although constituting less than a fourth part, numerically, of the known elements, also compose the great bulk of the inorganic world, and a few of them are active agents, always at work, in modifying the constitution and aspect of both organic and inorganic nature. Both animate and inanimate matter, therefore, claims these elements by common inheritance. Widely different as *living* is from *dead* matter, when viewed in the mass, the vitalized element yet varies in no sensible respect from the inorganic, and indeed living matter of one body must be previously divested of life before it can enter into the

constitution of living matter in another body. It is impossible, therefore, to distinguish the elements of living from those of dead matter, and perhaps the only difference, if any, is, that besides being governed by the laws which operate on matter in general, the living particles are such by virtue of being perpetually in motion; so soon as this ceases they come exclusively under the influence of the non-vital forces, and virtually take the characteristics of dead matter. The elements composing the human body all come from without—none are generated, or changed, or destroyed within it—they enter it through appropriate channels from the inanimate world, are impressed with the breath of life within it, pass on through and to the tissues as living molecules, and after subserving all the purposes of the life-giving and life-sustaining principle, again become effete, are thrown off through certain outlets into the external world, there, though not changed, to be re-fitted for the purpose of again taking the same round in organic life. Thus—

> "———O'er the wreck, emerging from the storm,
> Immortal Nature lifts her changeful form,
> Mounts from her funeral pyre on wings of flame,
> And soars and shines, another and the same."

In one sense, therefore, the human body may be considered merely as an organized medium, through which certain elements of nature are destined to pass, and in their passage maintaining the play of the vital functions, and undergoing chemical changes essential to the integrity of the organism. The transit of these elements is proved by the fact that the weight of the same body now, compared with its weight a year hence, may remain unchanged, notwithstanding several hundred pounds of aliment have entered it during that period.

If the weight of material passing through the body be so greatly in excess over that of the body itself, it would be a matter of interesting enquiry to investigate the purposes these numerous elements subserve, not only in the animal organization, but also in the whole economy of surrounding nature. This law of excess is not only maintained in the adult, but is also manifest during the period of development and growth from the earliest point of organic life up to full maturity, and ceases only with vital existence.

When it is considered that the starting point, or *punctum saliens* of the human body is a diminutive germ, only to be seen by a good microscope of high power, and hundreds of which can rest on the

point of the finest needle, it is not difficult to be convinced that the materials which enter into the formation of that body, throughout all its stages, from the primitive germ up to the magnitude of man, must come from exterior sources. We find these in the air, in the water, in the earth, and in organic nature, and to know ourselves aright it is requisite for us to study these sources of our organization.

The air we breathe, whether viewed as a mechanical or chemical combination, is mainly composed of oxygen and nitrogen, containing also varying proportions of carbon, in the form of carbonic acid, and hydrogen, in the form of water and ammonia, and is the recipient likewise of all other volatilized products from the earth's surface. These, you will observe, are all elements already named as belonging to the human body, and, as we shall soon see, have an important relation to its welfare. This air, likewise, possesses physical properties, and is combined with ever-changing quantities of heat, electricity and light, whose hygienic influences are incalculably great.

The water we drink, and without which the organism could not be maintained, consists of oxygen and hydrogen, both elements of the human body. As a vehicle of heat, with which it is always associated, it bears important relations to the animal economy.

In the earth we find all the elements that are contained in the air and in the water, besides many others—indeed, all the elements yet discovered, exist within its bosom. Those, however, which it contributes to the human body, either directly or indirectly, are phosphorus, sulphur, chlorine, fluorine, silicon, sodium, calcium, potassium, magnesium, iron and manganese. It is also associated with the imponderable bodies in such a way as to have a bearing upon the health of the human body.

Organic nature, vegetable and animal, contain principally the same elements as does the human body, and its intimate connection with our organization is seen in the fact of its being the grand source of nutriment.

Here then are air, water, earth and organic matter, constituting the whole of terrestrial creation, and consequently embracing the elements of the human organism, and it is the appropriation, aggregation, and arrangement of these elements that give to man his peculiar constitution and physical form. Like the formative process in the solid rock, atom is superimposed upon atom, until the

infinitessimal invisible point of living matter, acting as a nucleus in drawing to itself the nutrient elements around, and with a power of incorporating them with its own substance, and of combining them into the proximate principles that may serve as the materials for its development, it gradually increases in size, until it is unfolded into the beautiful configuration of the human form. Still, thus viewed, man, soulless man, man physical, stands as the solid rock, as the primitive statue of clay fashioned by the Hand of the Almighty. But there is breathed into its nostrils a "breath of life," which, quickening every fibril, causes the crimson fountain to gush through every avenue, and man becomes a living being. The vital principle, animating these elements, is imbued with the Spirit of God, which becomes a more important nucleus in attracting elements of a less gross material, some characterizing animal nature in general, but others mysteriously connected alone with humanity. Like the elements of physical organization, those of the spiritual come from without. We now have presented to us man physical, man vital, man spiritual. He now stands forth as the Lord of creation, beautifully and wonderfully made, an atom in his origin, which, by exterior and innate influences, has progressed into the perfect man, the human form divine.

Man, therefore, as he stands on earth, is essentially a compound of flesh and spirit, and as the spirit, at least so far as our senses are concerned, has no manifestation, save in connexion with matter, the human body, during life, must be considered as the proper temple of the soul, and consequently must be maintained in perfect order to accommodate its previous tenant, and to enable it to carry out all the noble purposes designed by the creator. Let us, then, examine into the requirements necessary to give strength, health and vigor to the bodily organs and powers, as essential to the perfect manifestation of mind.

The blood, which is alive, in circulating through the living body, is the vehicle of life to every atom of our organization. Every particle of every bone, muscle, membrane, nerve and vessel, and every drop of the various fluids of the body, must have pre-existed within this fountain of life. It must, therefore, necessarily subserve all the purposes of nutrition, and furnish materials to the secreting organs, and after yielding up the elements necessary to these objects, it again becomes charged with the effete molecules arising from the degeneration of the tissues, and conveying them

to the several outlets of the system, the organs of excretion throw them off into the exterior world. Hence arises a constant necessity for fresh supplies, which are furnished through the functions of digestion and absorption. Yet the blood, although a living fluid, has no power to move itself, or to alter the quantity and quality of its own ingredients. Its circulation is dependent upon two principal forces, located at the two extremes of the vessels, the one propelling, and the other drawing the circulating fluid, while its variations in quantity and quality are wholly owing to other agents always in operation. One of the most active of these agents is the oxygen of the air, inspired by the lungs, and which being absorbed by the blood, is carried by it to the distant tissues, and acting on their elements, produces innumerable and recognizable changes throughout the entire body. Respiration, therefore, the first and last act of separate existence, is a function of great moment to the maintenance of health. By it the blood and air are both made to meet in the air cells of the lungs, intercepted only by a thin membrane, which does not interfere with the physical and chemical action of these fluids upon each other. It is worthy of remark, too, that the circulation of the blood through the lungs is of the most simple kind, the vessels being free from valves, unaffected by atmospheric pressure, and uninfluenced by muscular contractions. It is, also, worthy of remark that the blood, flowing from the heart to the lungs, is unfit for nutrition until it meets with the air taken in by respiration. By their contact the composition of both becomes changed. The air is warmed, the proportion of carbonic acid and watery vapor is increased, and that of oxygen diminished. Consequently heat, carbonic acid, and water escape from the lungs, while oxygen is taken in. With regard to the blood its most obvious change, in passing through the lungs, is in color, changing from a dark crimson to a bright scarlet, from venous to arterial blood, from a poisonous to a nutrient fluid. This change in color is important merely as an indication of essential alterations in its composition, such as an increase in its temperature, its more rapid and firm coagulation, its accumulation of oxygen, and its loss of carbonic acid and of nitrogen. The oxygen extracted from the air is carried by the arterial blood from the lungs back to the heart, and thence to the various parts of the body, and thus is brought into direct contact and intimate relation with the elementary molecules of the tissues. With these elements it may

co-operate in the process of nutrition, in the production of animal heat, and in the removal of disintegrated and effete matter. A large proportion of these worn-out elements consists of carbon and hydrogen, which take the form of carbonic acid and water, by uniting with the oxygen, and being absorbed into the venous blood, are conveyed by it to the heart, and thence propelled to the lungs, to be discharged again into the atmosphere. When the process of respiration is stopped, the circulation of blood through the lungs is retarded, carbonic acid accumulates in the blood and the tissues, and asphyxia and death are the necessary consequences.

The extrication of carbonic acid, and the absorption of oxygen, are not less essential to the continuance of life in the production of animal heat, and the maintenance of a uniform temperature of the body, both of which are intimately associated with the process of respiration, and certain chemical processes going on in the system, modified to a certain extent by the influence of the nervous system. I mentioned that the oxygen inspired is most probably combined in the systemic capillaries, or minute vessels, with the carbon and hydrogen of disintegrated and absorbed tissues, and I may add, with certain elements of food which have not been converted into tissues. In these processes heat must be continually produced in the animal body, on the very same principle that it is generated by the burning of a candle or the combustion of our fires. And since the heat thus arising will be extricated wherever the blood is carried, every part of the body will be heated equally, or so nearly equally, that the rapidity of the circulation will quickly remove any diversities of temperature.

As the supply of blood depends upon digestion and absorption, so a necessary relation, in the maintenance of perfect health, must exist between the oxygen inspired, and the quality and quantity of the food taken into the stomach. In the northern regions, and in the cold seasons of more southern climes, the quantity of food consumed is greater, and its quality more carbonaceous, than in opposite conditions of climate and seasons, because larger quantities of oxygen are breathed from the cold dense air, and more heat is required to be evolved to supply the body with that of which it is robbed by the external cold. Digestion, therefore, has for its object the preparation of our food, rendering it capable of absorption into the blood, and fitting it for the formation and repair of the tissues, and, in common with the respiratory function, also for

the production of animal heat. The use of food, therefore, having these two objects, the various articles of diet have been divided into two great classes, corresponding with these objects, viz :—*nitrogenous* and *non-nitrogenous* foods. The former is converted into the albumen or fibrine of the blood, and subsequently assimilated by the tissues, and hence called also *nutritive* or *plastic* principles ; and the latter being employed in the production of heat, is called *calorifacient*, and, having this power in consequence of the process of respiration, also *respiratory food*. This classification differs from the more easy division into animal and vegetable, and is preferred to it in being more philosophical, as it is applicable to either divisions of organic nature, the nutritive and respiratory principles existing in both the animal and vegetable kingdoms. These principles being identical, the human body may be supported upon a diet exclusively vegetable, or exclusively animal, but the structure of the teeth and of other parts, as well as observation and experience, seem to indicate that man is intended to be omniverous.—Animals fed upon grass and herbs exclusively, form flesh and blood in every respect like those belonging to the carnivora, which live only on animal matter, a circumstance strongly corroborative of the fact that vegetables and animals contain alimentary principles identically the same. Experiment and analysis, however, also prove that albumen, caseine, and fibrine, which constitute the proteinaceous compounds, and which are the principal materials in animal food, exist also in vegetables, and hence vegetables can contribute to the formation of blood and tissue.

Of the elements before noticed as constituting the human body, four of them, oxygen, hydrogen, carbon and nitrogen, are called *essential*, and yet organic compounds, composed only of these elements, cannot be nutritious. They require the presence of the *incidental* elements, phosphorus, sulphur, iron, &c., and also of compounds which are *naturally* combined with them. Neither can life be maintained by the exclusive use of either of the alimentary principles, a mixture of nitrogenous and non-nitrogenous substances, with the inorganic principles contained in them being essential.

The food, after having been introduced into the stomach and alimentary passages, undergoes certain changes, and is then absorbed into the circulating system, to be distributed by the blood to every part of the living body, and after contributing to the wants

of the system, again disappears from it. Now it is a remarkable fact that the body maintains, through a series of years, the same features, size, form, and even weight, although, during all this period, its several portions are continually changing—every particle decaying and being removed, and again replaced by the deposit of new ones, which, in turn, also die and pass away. This does not apply merely to the general similarity of the entire body, but every part and organ, as much as the whole, exactly maintains its form and composition in the issue of the changes continually taking place among its particles.

In order to accomplish the process of nutrition perfectly, the most important conditions, in addition to good air and diet, are a proper state and composition of the blood, a regular supply of it, a certain influence of the nervous system, and a natural state of the parts to be nourished. If any one of these conditions be absent or defective, the process is liable to be disarranged, and the various diseases arising from impaired nutrition appear to be due to their failure, more than to the imperfection of the process itself.

We now come to a point in the physical organization, more immediately associated with the mind, viz: the *brain*. The brain and nervous system are governed by the same laws of nutrition as other parts of the body, and like them, have their functions impaired from similar causes. The mind acting through the functions of the brain, the manifestions of the former must correspond with the conditions of the latter. When the brain is in a state of perfect health, the mind perceives and retains sensations; performs acts of will; holds impressions of sensible things, and revives them in subjective sensations and ideas; and it manifests itself in its higher emotions and feelings, and in its faculties of judgment, understanding, memory, reflection, induction, imagination, &c., the mind acting thus in and through this organ in all operations having immediate relation to external and sensible things. This view of the action of the mind, perfectly harmonizes with its other and higher faculties, by which it has attained, or may attain, to knowledge superior to the senses. I mean the *conscience* and the *pure reason*, which are reached through other channels than the organs of sense, and exercised independently of the brain.

Although the brain is the organ of the mind, there still may be supposed to exist an immaterial principle, independent of organic structure, yet incapable of external manifestation, or of external

impressions, save through the medium of the brain and nervous system. These organs may be injured or diseased, and this principle would remain unchanged, although its acts, as connected with them, might be hindered or disturbed, and yet it might well be supposed that the size of these organs, and the power with which the several faculties of this principle are manifested, would bear a direct relation to each other.

Abundant as is the evidence that the brain is the organ of those parts of the mind which are concerned with the things of sense, its connexion with those powers that are occupied with things above the senses, is much more obscure and doubtful. "The reason or spirit of man which has knowledge of divine truths, and the conscience, with its natural discernment of moral right and wrong, cannot be proved to have any connection with the brain. In the complex life we live, they are, indeed, often exercised in questions in which the intellect or some other lower mental faculty is also concerned; and in all such cases, men's actions are determined as good or bad, according to the degree in which they are guided by the higher or by the lower faculties. But the reason and the conscience must be exercised independently of the brain, when they are engaged in the contemplation of things which have not been learned through the senses, or through any intellectual consideration of sensible things. All that a man feels in himself, and can observe in others, of the subjects in which his reason and his conscience are most naturally engaged; of the mode in which they are exercised, and the disturbance to which they are liable by the perceptions or ideas of sensible things; of the manner and sources of their instruction; of their natural superiority and supremacy over all the other faculties of the mind; and of his consciousness of responsibility for their use; all teach him that these faculties are wholly different, not in degree only, nor as different members of one order, but in kind and very nature from all else of which he is composed; all, if rightly considered, must incline him to receive and hold fast the clearer truth which Revelation has given of the nature and destinies of the spirit to which these, his highest faculties, belong."

I have thus presented a general view of the structure and functions of the human body, avoiding technical language as much as possible, in order that the intimate relation between intellect and organization might be readily comprehended. I cannot pretend, in

a limited discourse like this, to illustrate in detail the immense influence exercised by the mere physical condition over the development and power of the mind. If I can, by a few general propositions, impress upon you the importance of this relation and sympathy, and can persuade you to give to the subject close and thoughtful consideration, it is all I aim at.

The maintenance of a proper balance between the several portions of the human body, and between the body and external nature, is essential to the existence of high health — health of body and of mind. Every organ has its appropriate function, and the exercise of that function, within certain limits, maintains that organ in a state of health, and so far it contributes towards the welfare of the whole structure. But if over-exercised, that organ in the same proportion, is injured, and the general system sympathises with the derangement. It is a law of nature that exercise must alternate with repose. The stomach is intended for the reception and digestion of food, and yet it would be fatal to be always cramming food into it. The muscles are appointed for every movement of the body, and yet the most powerful frame would sink under uninterrupted action. The brain is the organ of the mind, but an overstrained brain is unfit for intellectual manifestations. And thus it is with every organ, and with the aggregate of organs as exemplified in the whole man. Activity and repose must succeed each other. Both are essential to perfect health.

The physiological exposition of the human body, just made to you, renders it sufficiently evident that the healthful play of its organs must mainly depend upon agents exterior to and surrounding it, and that consequently the study of these agents is equally as important and vital. It may be said without hyperbole, that the life of man is dependent upon that of a blade of grass, for the influence of vegetation upon the air is essential to the support of animal existence. The air we inspire must be pure, to maintain healthful action, and yet the respiratory process is one of the great causes of the deterioration of air. Hence a portion of confined air, originally pure, may thus, by a vital process, be soon converted to an actual poison to the human system. This result cannot occur in the open air, as every tender leaf rapidly consumes this poison, converts it to its own substance, and returns in exchange a proportionate quantity of the life-sustaining element. The importance, therefore, of exercise in the open air, the necessity of thor-

ough ventilation in our buildings, and especially in our sleeping apartments, and a watchful regard to architectural arrangements for that purpose, become obvious. Air is an indispensable condition of human life, not only in its constituent parts, but also in its physical properties, influencing all the vital functions. A healthy person exercising in pure air, increases the vigor of his circulation, every organ is excited to healthful action, the vital air is more abundantly supplied to the blood, and the brain is thus invigorated by its appropriate stimulus. "Light, warmth, and life, are thus transmitted to the nerves; the soul is put into a suitable relation to the elements of this glorious world; all the senses are rendered fitter for their proper service; the mind becomes alert, and the measure of earthly — that is to say, animal — happiness is full."— Exercise in the open air also implies exposure to light, the influence of which is also necessary to the development, form and health of organized bodies. When deprived of this vivifying stimulus, both animals and plants become weak and depraved in their organization. Dark habitations, narrow streets, little windows, and every thing that excludes light from our dwelling places, are faults in architecture, contravening the laws of health. "Action, life, feeling, thought, are all associated with light."

I have said that exercise must alternate with repose. Repose of the body favors the action of the mind. Intense thought and reflection shut out the world, and restrain the motions of the body, and however favorable to imagination slight exercise may be, yet the mind cannot be concentrated in the midst of violent agitations of the body. Still, in our schemes of education, we should be careful that they embody sunshine and breeze, nerve and muscle, as well as books; that mental application should be regularly interchanged with exercise in the open air, and entire exemption from study, lest the body become enfeebled and diseased, and the mind distorted in all its faculties. The proper object of education should be to develop the powers of both body and mind, and to adjust their equilibrium by appropriate exercises, which expand both mind and body into full beauty and strength.

"Education applies to the whole man, not to a part only of his nature. It takes in the whole character, the whole life. We are complex, not simple beings. Complexity of structure is that which distinguishes man; the disembodied spirits above him, the animals below him, have not so various a being as his. Man's life is man-

ifold; he has a bodily organization, a mental frame, a moral constitution; he has senses, and intelligence, and a soul. They must all be educated, and educated contemporaneously and harmoniously. He who trains the physical frame, must remember that it is not a brute that he is teaching to move with freedom and grace. He whose office it is to inform and discipline the intellect, must remember that mysterious connections bind the faculties which are under his care to a frail body, and yet more mysterious sympathies draw those faculties towards an Infinite object. While he who attempts to assist the soul in its progress towards perfection, should remember that neither asceticism, nor inward contemplation alone, can give to the spiritual exercises of such a being as man the character which, for his own good, they should bear. To educate one, is to consult for his whole capacity, and his whole advantage,—to teach him and to help him to become what he was meant to be by his creator."

From what was stated respecting the nutrition of the body, it will be understood that there are other organs besides the lungs and limbs; and other agents besides air and light, which have to assist in maintaining the proper balance of the functions of the human body. It has been observed that "the study of the stomach is the study of morality," and that "the food has a higher bearing on the mind than on the physical frame of man." "The comfort and efficiency of intellect, nay, the moral perception, manliness, and virtue of the mind depend greatly on our use of aliment; and in the very means by which we sustain the strength of the body, or most directly disorder its functions, we, at the same time, either fortify or disable the brain, so that we shall be qualified to use our faculties with advantage, or else, amid the confusion of our sensations, be rendered incapable of rational attention." Habitual moderation in eating and drinking, as it best contributes to the health and development of the body, is essential to the proper manifestation of intellect. Gluttony and starvation are equally injurious to both mind and body. A happy medium maintains the blood in its best condition for the purposes of the mind while intently acting on the brain. Neither is sameness of diet congenial to the development and support of the mental faculties, particularly when associated with too restricted a mode of life. It has been observed by a phylosophical writer, that probably as the intellect of man cannot be fully developed without free intercourse with every va-

riety of mind, nor that of society without international commerce, so neither can the body attain and preserve its best state without occasional change in the kind of food, such as the diversities of climate and of season are intended to produce. Abstemiousness and occasional fasting, when not too prolonged or conjoined with much muscular exertion, are also favorable to mental effort, and invigorate both mind and body, besides being a better remedy than medicine when the circulation is oppressed, either by disease or repletion.

Every thing that excites or depresses the nerve-power, disturbs, to that extent, the equilibrium between mind and body, and interferes with perfect health. All stimulants, intoxicating agents, and narcotics, which include fermented liquors and tobacco, habitually and unnecessarily used, must, therefore, prove injurious, by acting directly on the brain, on the ganglionic system of nerves, on the spinal cord, or on the nervous system generally. All these substances have been proved by analysis to contain more carbon than hydrogen, and hence, also, seem to interfere with the proper vitalization of the blood by respiration, and, as a consequence, impair the tone of both body and mind.

But I am admonished by the time I have already occupied, that I must bring this address to a close. It is impossible to embrace precise details in a subject so extensive, and in a period of time so limited. I have merely endeavored to lay down some prominent data, and impress them upon your attention in such a way as to induce you to ascertain their final results by the study of Anatomy, Chemistry, Physiology and Hygiene, in order to a right management of your physical and mental being. And, is there any thing more worthy of study than your own nature, the acquisition of that knowledge which comprehends the highest condition of man, and enables him to fulfill, under Divine guidance, his exalted and holy destinies?

Health and strength are necessary elements of worldly prosperity, and are intimately associated with intellectual development and power. They are the foundation of all labor, and thus appear as the only real capital of a country. As the temporal prospects of a family may be affected by the physical disability of its members, so the condition of a state or nation may be influenced by the decaying powers of its citizens. Dr. Howe, in his report on idiocy, to the Commonwealth of Massachusetts, aptly remarks that "the health and vigor of the body may be compared to a man's capital;

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it is a trust fund given to him by the Creator, of which he may expend the interest in the natural enjoyments of life, but he cannot encroach in the least on the principal, without real loss. Every debauch, every excess, every undue indulgence, is at the expense of this capital. A rich man may throw away cents or dollars, and not feel it, — but he is really poorer for it; and a young man with a large capital of health, may daily throw away part of it, and still feel strong; but every over-stimulant to the nerves, every overload to the stomach, is a cent or a dollar taken from his capital; feel it, or not feel it, he is poorer for it."

If, then, the intellectual faculties and the exercise of the soul, depend so much upon the state of the organization, and, in attending to external impressions, be influenced by the condition of the senses and their connections, and these again by the state of the blood and the nervous power, physical education assumes an importance which appeals strongly to the political economist, the statesman, the philanthropist. "The vigorous growth of the body, its strength and its activity, its powers of endurance, and its length of life, on the one hand; and dwarfishness, sluggishness, infirmity and premature death, on the other, are all the subjects of unchangeable laws. These laws are ordained of God; but the knowledge of them is left to our diligence, and the observance of them to our free agency. These laws are very few; they are so simple that all can understand them, and so beautiful that the pleasure of contemplating them, even independent of their utility, is a tenfold reward for all the labor of their acquisition." They apply to every stage and condition of life, from its earliest dawn, up through childhood, youth, and manhood, and down through old age and decrepitude, to the grave itself. They embrace the relations which the human body has with the atmosphere—its barometric, its thermometric, its hygrometric conditions; with animal and vegetable effluvia and miasmata; with electricity, light, sound; with food — its quality and quantity, and periods and modes of eating and drinking, and of abstinence and fasting; with exercise and rest; with vigilance and sleep; with clothing; with the sensations, affections and passions; and indeed with every thing that may either induce or avert disease. "When the religious man reflects, that our bodies are God's workmanship, he sees that the laws impressed upon them can be no less than God's laws. If these laws, then, are God's laws, we are bound to recognize and obey them. We are bound to obey a law which God has impressed upon the body, on the same principle that we are bound to obey a law which he has impressed upon the soul."

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